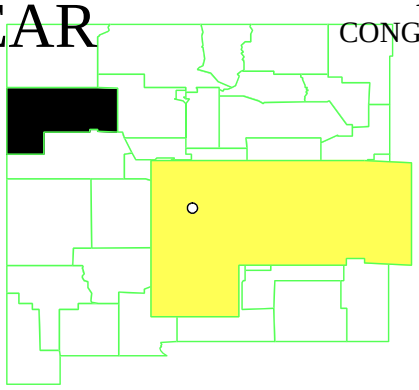
UNITED NUCLEAR CORPORATION

NEW MEXICO

EPA ID# NMD030443303'
Site ID: 0600819



EPA REGION 6
CONGRESSIONAL DISTRICT 03
McKinley County
Church Rock,

Updated: March 2004

Other Names:
UNC Mining and Milling
Church Rock Mill

SITE DESCRIPTION

Location:
- 17 miles northeast of Gallup, New Mexico.
- Located on southern border of Navajo reservation.

Population:
- The surrounding area is sparsely populated, with the nearest residence located 1 1/2 miles from the site. A Navajo Indian Reservation lies 1/2 mile to the north of the site.

Setting:
- Four water wells are within a 4-mile radius, the nearest being 2 miles northeast of the site; however, nearby residents generally have used bottled water for drinking, since the well water had a bad taste.
- Tailings impoundment - 100 acres, 15-20 feet thick.
- Abandoned mill facility - 25 acres.
- Tailings unstabilized.
- Nearest residence is 1.5 miles to the north.
- Nearest drinking water well is 1.7 miles.

Hydrology:
- Site underlain by Upper Gallup and alluvial aquifer.
- Alluvial contamination to north and south; bedrock contamination to north and east.
- Tailings pile adjacent to pipeline arroyo.

PRESENT STATUS AND ISSUES

Remedial action activities are being conducted by the United Nuclear Corporation (UNC) to address tailings seepage in ground water. UNC utilizes extraction wells to pump the contaminated ground water and evaporation ponds for water disposal. UNC also monitors the performance of the remedial systems on a quarterly basis to evaluate the effectiveness of those systems in achieving the established cleanup standards and to delineate the current extent of seepage impacts in ground water.

Currently, a temporary shut-down of the ground water remedial systems is in progress to allow the regulatory agencies the opportunity to evaluate the effectiveness of those systems in attaining cleanup standards. Performance monitoring has shown that further attenuation of contaminants to cleanup standards may not be achieved within a reasonable time frame by the operation of those systems. An evaluation report on the Southwest Alluvium was completed in November 2002, following an 18-month shut-down period to monitor natural attenuation. That report also included an evaluation of the technical impracticability (TI) of achieving all of the established cleanup standards for ground water. The EPA is

currently assessing the results of the TI evaluation. The EPA determined that the information on natural attenuation was insufficient and directed UNC to continue the test for at least one more year. The EPA completed a second Five-Year Review of the remedy in September 2003. In that review, the EPA determined that the remedy was protective of human health and the environment since there was no known exposure to the ground-water contamination. However, the EPA also recommended that a supplemental feasibility study be performed to evaluate other remedial alternatives to support future EPA decision making.

As part of the 2003 Five-Year Review, EPA is considering institutional controls (ICs) to restrict the use of contaminated ground water on tribal land. The Navajo Nation has indicated that it does not currently favor the use of ICs.

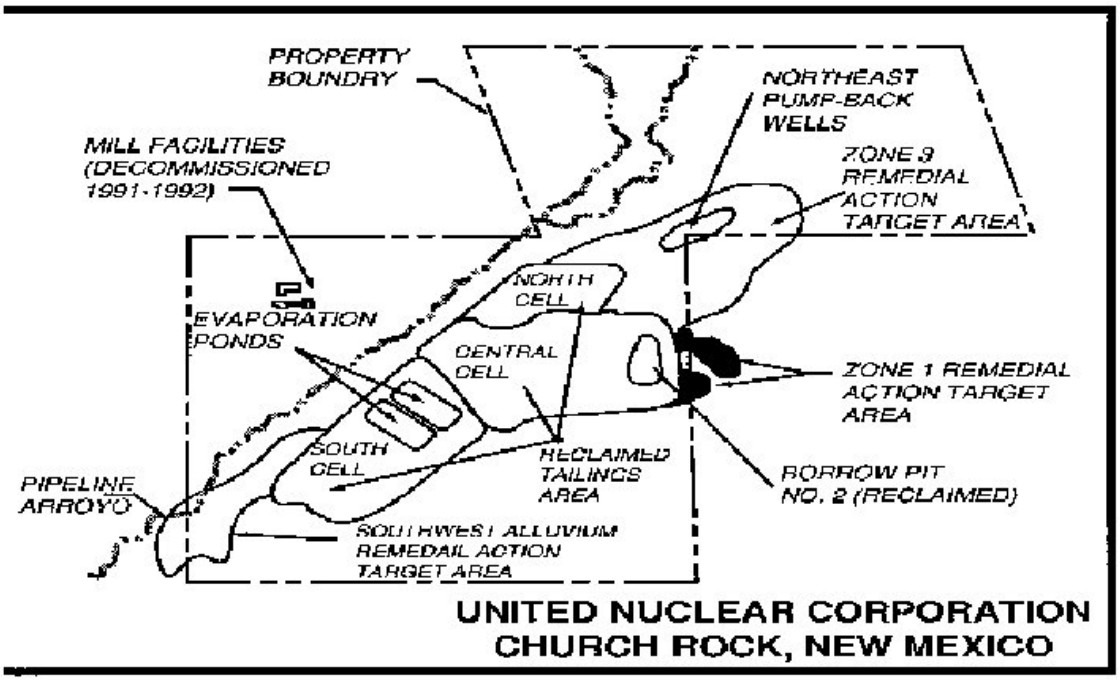
WASTE AND VOLUMES

- The principal pollutants include acidic mill tailings.

  - Total dissolved solids: > 60,000 parts per million (ppm) in tailings liquid)
  - Sulfate: > 40,000 ppm tailings liquid
  - Thorium: 40,000 picocuries/liter (pci) in tailings liquid
  - Radium: 24 pci/l tailings liquid
  - Aluminum: > 2000 ppm in tailings liquid
  - Ammonia: > 5000 ppm tailings liquid
  - Iron: > 4000 ppm (tailings liquid)

- 4.7 million cubic yards tailings

SITE MAP



SITE ASSESSMENT AND RANKING

NPL LISTING HISTORY
Site HRS Score: 30.36
Proposed Date: 12/30/82
Final Date: 9/08/83

SITE HISTORY

- Mining began in area in 1968.
- New Mexico issued radioactive materials license to UNC in May 1977.
- Uranium mill opened in July 1977.
- Tailings pond dam failed in 1979 releasing 93 million gallons of slurry to Rio Puerco.
- November 1979, UNC developed a Ground Water Discharge Plan for NMED to prevent tailings seepage from contamination ground water at the site.
- Mill closed in June 1982.
- Site was placed on NPL in 1983. Site was listed because of tailings seepage and off-site migration of radiological and chemical contaminants in ground water.
- EPA initiated remedial investigation/feasibility study (RI/FS) in March 1984 to determine the nature and extent of ground water contamination in the Southwest Alluvium and Zones 1 and 3 of the Upper Gallop Sandstone.
- New Mexico ceded uranium mill licensing authority to NRC in June 1986.
- August 1986, EPA and NRC signed Memorandum of Understanding (MOU) for coordination of UNC's reclamation and ground water remediation activities. NRC is designated the lead federal agency and is responsible for surface reclamation and source control. EPA is responsible for ground water remediation.
- UNC submits draft reclamation plan to NRC in 1987
- EPA completed RI/FS and issued Record of Decision (ROD) in September 1988. EPA selected ground water extraction and evaporation remedy to address ground water contamination at the site. The remedy incorporated the corrective action plan previously required by NRC under
- Reclamation construction activities commence in 1988, three years prior to final approval of reclamation plan
- Remedial Design for tailings seepage remediation was approved by EPA on September 12, 1989.
- Remediation of ground water commenced in the Fall of 1989.
- Reclamation plan was approved by NRC in 1991
- UNC completed mill decommissioning, decontamination, and placement of the interim cover on the tailings site by November 1993.
- At the request of UNC, NRC has modified it's license to allow the mill site and the buildings area for unrestricted use. The restricted area is now limited to the tailings site. The modification was approved by NRC in April 1995.
- Five-Year Review was completed by EPA on September 25, 1998. Based on the review, EPA concluded that the reduction of contaminant levels to cleanup standards in ground water had not yet been achieved. EPA also concluded that the continued operation of the ground water remedial systems for the Southwest Alluvium and Zone 1 would not achieve the established cleanup standards within a reasonable time frame due to low water saturations and production at the extraction wells. Further, the operation of the remedial system for Zone 3 would not provide an effective hydraulic barrier to contaminant migration. Such pumping appeared to successfully dewater most of the target area, but may also have pulled contaminated ground water downgradient.
- UNC discontinued operation of the remedial systems for Zone 1 in July 1999 due to a lack of water

production. UNC continues to perform water quality monitoring.

- A temporary shutdown of the Southwest Alluvium groundwater recovery system was conducted beginning in January 2001 to evaluate the effectiveness of the current remedial system and natural attenuation. Quarterly ground water monitoring was performed as part of this evaluation through June of 2002. An evaluation report is to be completed by September 2002.
- In July 2002, UNC installed four new monitoring wells in Zone 3 to define the leading edge of the contaminant plume and evaluate whether the plume has stabilized or continues to migrate downgradient. UNC continues to collect monthly water quality data from Zone 3 as part of the evaluation.
- In November 2002, UNC submits a report on the 18-month natural attenuation test for the Southwest Alluvium and an evaluation of the technical impracticability for attaining cleanup standards.
- In January 2003 EPA issued a community fact sheet announcing the start of its second Five-Year Review.
- In May 2003, UNC submits proposal for hydraulic fracturing pilot test for Zone 3.
- UNC conducts hydraulic fracturing pilot test for Zone 3 in June 2003.
- In September 2003, EPA completed second Five-Year Review on the remedy. The findings of the review showed the remedy to be protective of human health and the environment since there was no known exposure to the ground water contamination.
- UNC submits results of hydraulic fracturing pilot test and proposed design for full scale operation to EPA in December 2003.

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

- Several people use shallow alluvial aquifers in the area. The nearest domestic/livestock well is 1.7 miles downgradient of the site in the Upper Gallup aquifer.

- Contaminants of Concern: heavy metals, low level radionuclides, nitrates, sulfates and dissolved solids.

- A break in the tailings dam in 1979 sent 93 million gallons of tailings fluid into the Rio Puerco. The upper Gallup aquifer is contaminated in the vicinity of the pond. However the dam break was not the reason for the listing of the site on the NPL.

RECORD OF DECISION

Signed:
September 30, 1988

- The remedy includes: Ground water pump and treat in the Upper Gallup Zone 3 aquifer and Southwest Alluvial aquifer; limited action in Zone 1 of the Upper Gallup Aquifer.

Other Remedies Considered

1. No Action
2. Limited Action

3. Pump and treat in Zone 3, Southwest Alluvium, and two hot spots
4. Pump and treat in Zone 1, Zone 3, Southwest Alluvium, and two hot spots

COMMUNITY INVOLVEMENT

- Community Involvement Plan: Developed 06/84, revised 05/89
- Open houses and workshops: 08/88, 2/92, 11/98
- Original Proposed Plan Fact Sheet and Public Meeting: 08/88
- Original ROD Fact Sheet: 10/88
- Milestone Fact Sheets: 05/90, 06/91, 2/92
- Citizens on site mailing list: 227
- Constituency Interest: No population center near the site. Major concern has been potential water well contamination for nearby Navajo reservation, but no actual contamination has been noted. Interest in the Rio Puerco continues with water hookups as the primary request.
- Site Repository: Gallup Public Library, 115 West Hill Avenue, Gallup, NM 87301

TECHNICAL ASSISTANCE GRANT

- Availability Notice: 01/89
- Letters of Intent Received: None
- Grant Award: N/A

CONTRACTS

- **Remedial Project Manager (EPA):** Mark Purcell, 214.665.6707, Mail Sta. 6SF-LP
- **State Contact:** Robin Brown, 505.827.2434
- **Navajo Superfund Contact:** Diane Malone, 520.871.7327
- **Community Involvement Coord. (EPA):** Robert Johnson, 214.665.66676, Mail Sta. 6SF-PO
- **Attorney (EPA):** Jim Turner, 214.665-3159, Mail Sta. 6RC-S
- **State Coordinator (EPA):** Kathy Gibson, 214.665.7196, Mail Sta. 6SF-LT
- **PRP(s) :** United Nuclear Corporation
- **EPA Oversight Contractor:** None

BENEFITS

- The reclamation actions performed at the site between 1988 and 1996 have stabilized the mine tailings and have protected the Rio Puerco from further contamination spills.

- Portions of the site are now used for animal grazing by local residents, an environmental and economic benefit to the Navajo Nation.